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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/518,265
Filing Date: December 16, 2004
Appellant(s): ROBERTS, DAVID KEITH

Larry Liberchuk
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/03/2008 appealing from the Office action mailed 07/10/2008.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Celik et al, "Hierarchical Watermarking for Secure Image Authentication With Localization", IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 11, NO. 6, JUNE 2002.

6,804,356	**Krishnamachari**	**10-2004**
6,477,276	**Inoue et al**	**11-2002**
2003/0172275	**Lee et al**	**09-2003**

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The rejection of claims 1-3, 5-7, 12-14 and 18-23 are based on Celik et al (NPL document titled " Hierarchical Watermarking for Secure Image Authentication with Localization") in view of Krishnamachari et al (US Patent No.: 6,804,356).

Claims 1-3, 5-7, 12-14 and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Celik et al (NPL document titled: "Hierarchical Watermarking for Secure Image Authentication with Localization") in view of Krishnamachari et al (US Patent No.: 6,804,356).

As to independent claim 1, Celik teaches a method of authenticating an audio-visual signal (hierarchical watermarking for secure image authentication, see title) comprising formation of a progressive signature (see page 589, section B, [p][003], where the better signature is formed at each level) by generating a variable number of

signature bits (note that signatures are computed for each block, see page 589, section B, [p][001-003]). However, Celik does not teach the method further characterised in that said number of signature bits increases with the complexity of said audio-visual signal. Krishnamachari teaches a hierarchical image authentication method, (see column 1, lines 5-8) further characterised in that said number of signature bits increases with the complexity of said audio-visual signal (see Fig 2B). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have combined the teaching of Celik and Krishnamachari for creating authentication signatures for digital image which is difficult to duplicate if the image is altered (column 2, lines 1-5 and lines 19-21).

As to claim 2, Celik teaches the method comprising the steps of splitting said audio-visual signal into blocks and progressively decreasing the size of said blocks (see Fig 2, where the image is divided into blocks of decreasing size).

As to claim 3, Celik teaches the method further comprising the steps of generating said signature from the contents of said blocks (see page 589, section B, [p][002], where the signatures are computed from each block), whereby said number of signature bits progressively increases with decreasing block size (since signatures are computed for each block and the block size are decreasing, the number of signature would increase, see page 593, section C, [p][003]).

As to claim 12, Celik teaches the method further comprising the steps of implanting said signature in said audio-visual signal and/or storing or transmitting said audio-visual signal (see page 589, section B).

As to claim 13, Celik teaches the method whereby the signature is implanted in the audio-visual signal as a watermark (see page 589, section B).

As to claim 14, Celik teaches the method further comprising the step of verifying the authenticity of said audio-visual signal by verifying said signature (see page 90, section C).

As to claim 18, neither Celik or Krishnamachari teach the method whereby said step of generating signature bits based on said DC-differences is characterised by thresholding said DC-differences. Inoue discloses a method for embedding and extracting digital information that includes the step of generating signature bits based on said DC-differences is characterised by thresholding said DC-differences (see column 38, lines 45-50).

As to claim 19, Celik teaches the method, wherein said audio-visual signal is a digital image (see abstract).

Claim 20 differ from claim 1 only in that claim 1 is a method claim whereas, claim

20 is a system claim. Thus, claim 20 is analyzed as previously discussed with respect to claim 1 above.

Claim 21 differ from claim 5 only in that claim 5 is a method claim whereas, claim 21 is a system claim. Thus, claim 21 is analyzed as previously discussed with respect to claim 5 above.

As to claim 22, Celik teaches the computer readable medium (memory, page 593, section D, line 3) having a plurality of computer-executable instructions (software, page 591, section A, [p][002], line 12) for performing the method according to claim 1 comprising a program module (see Fig 8) for formation of a progressive signature giving instructions to a computer for generating a variable number of signature bits.

Claim 23 differ from claim 5 only in that claim 5 is a method claim whereas, claim 23 is a computer readable medium claim. Thus, claim 23 is analyzed as previously discussed with respect to claim 5 above.

As to claim 5, note the discussion above, Krishnamachari teaches the method further characterised by the steps of splitting said audio-visual signal into blocks (step 501, see Fig 5), merging similar blocks into regions (step 590, see Fig 5), and generating said signature based on said regions (note that additional signature are generated, see column 2, lines 8-12).

As to claim 6, note the discussion above, Krishnamachari teaches the method, the steps of merging similar blocks into regions and generating said signature based on said regions comprising the steps of calculating an image characteristics value for each of said blocks, assigning blocks with similar image characteristics values to regions, calculating differences between image characteristics values of said regions, and generating said number of signature bits based on said differences between said image characteristics values of said regions (see column 4, lines 6-42).

As to claim 7, note the discussion above, Krishnamachari teaches the method, said image characteristics values being DC-values (see column 3, lines 30-31).

1. Claims 8-9 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Celik et al (NPL document titled " Hierarchial Watermarking for Secure Image Authentication with Localization") in view of Krishnamachari et al (US Patent No.: 6,804,356) further in view of Inoue et al (Patent No.: 6,477,276).

As to claim 8, neither Celik or Krishnamachari teach the method further characterised in that said steps for the formation of said progressive signature are at least once looped. Inoue discloses a method for embedding and extracting digital information that includes the step of the formation of said progressive signature are at least once looped (see Fig 9). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have combined the teaching of Celik as

modified by Krishnamachari and Inoue for embedding and extracting digital information in transform coefficients of a digital image without losing information from an attack by an authorized user (column 4, lines 19-45).

As to claim 9, note the discussion above, Inoue teach the method further characterised in that the size of said blocks is decreased in each loop (see Fig 9).

As to claim 16, note the dicussion above, Krishnamachari teaches the method whereby the step of calculating DC-differences between said regions comprises the steps of arranging the DC-values of said regions in the order in which the regions are formed and calculating said DC-differences between consecutive regions for all regions (step 570, see Fig 5).

As to claim 17, note the discussion above, Krishnamachari teaches whereby the step of splitting said audio-visual signal into blocks is characterised by said blocks being formed in a previously formed region (550, see Fig 5).

2. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Celik et al (NPL document titled" Hierarchical Watermarking for Secure Image Authentication with Localization") in view of Lee et al (Pub No.: US 2003/0172275). As to claim 10-11, Celik does not teach the method further characterised in that the length of said signature with a variable number of signature bits is limited to a maximum

signature length and wherein said maximum signature length being defined as the maximum payload of the watermark. Lee discloses a real-time watermarking ([p][002], lines 1-4) characterised in that the length of said signature with a variable number of signature bits is limited to a maximum signature length and wherein said maximum signature length being defined as the maximum payload of the watermark(see [p][0016]). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have combined the teaching of Celik and Lee for real time watermarking embedding and extracting of a robust watermark that can survive attacks such as editing ([p][0023]).

3. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Celik et al (NPL document titled" Hierarchical Watermarking for Secure Image Authentication with Localization").

As to claim 24, Celik fail to mention the use of the method according to claim 1 in a surveillance camera or security camera or digital image camera or digital video camera or a medical imaging system. However, it would have obvious to used the method in a surveillance camera or security camera or digital image camera or digital video camera or a medical imaging system so that a digital signature in the form of a watermark can be inserted in an image created from any of the mentioned device so that the image can be later authentication if required (OFFICICAL NOTICE).

Allowable Subject Matter

4. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(10) Response to Argument

Appellant, on the top of page 6 of the appeal brief, states the Examiner conceded that Celik does not teach "said number of signature bits increases with the complexity of said audio-visual signal". Therefore to cure this deficiency, the Examiner introduces Krishnamachari. Appellant argues Krishnamachari fails to mention the limitation "said number of signature bits increases with the complexity of said audio-visual signal".

In reply: Krishnamachari teaches a hierarchical image authentication method, (see column 1, lines 5-8) wherein said number of signature bits increases with the complexity of said audio-visual signal as show in Fig 2 and describe in column 3. One skilled the art would define the term "complexity" as features or characteristics in an audio-visual signal. Krishnamachari clearly teaches properties of each block or sub-block in the audio-visual signal is obtained as a function of the characteristics of each block in column 3, lines 26-33. Thus, the number of signature bits calculated increases with the complexity audio visual signals or in other words, the number signature bits generated is a function of characteristics of the blocks in the audio visual signals.

Furthermore, in the specification on page 3, lines 18-25, Appellant defined the term "complexity" as the difference between calculated DC-values of block in the audio-

visual signal (signature bits are created based on these differences). Krishnamachari in column 3, lines 24-51 teaches characteristic values are extracted from each block and these characteristic values can include DCT coefficient, i.e. DC values. Moreover, in column 3, lines 1-5, Krishnamachari teaches characteristic values are compared to obtain a signature. Again, since the number signature bits is a function of characteristics of the blocks in the audio visual signals, the relationship between the number of bits generated and the complexity of the image is readily apparent.

Appellant, on the top of page 7 of the appeal brief, argues Krishnamachari simply obtains successive levels of detail of the image regardless of the complexity of the image. However, this point is moot, because regardless of the number of scales, the number of bits calculated is a function of the characteristic of the audio-video signal at each scale.

Claim 20, also requires the limitation “said number of signature bits increases with the complexity of said audio-visual signal”. Claim 20 is a system that performs the method of claim 1, therefore, arguments for claim 20 are analogous to those stated for claim 1.

Since Appellant believes that claims 2, 3, 5-7, 12-14, 18, 19 and 21 are not correct based upon a prima facie case not being established for claims 1 and 20, the same arguments provided by the Examiner for claims 1 and 20 also apply to these

claims. Note that Ionone and Lee were not relied upon for the rejection of claims 1 and 20.

Since the Examiner has established a prima facie case of obviousness for independent claim 1 and 20, all the remaining claims are properly rejected.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Andrae S. Allison/

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/Samir A. Ahmed/

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